

Stiffening arteries in teenagers with persistent obesity

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Children and adolescents with long-term obesity have increased arterial stiffness by their late teens, a study of more than 3,000 children followed from age 9 to 17 shows. These results, in the researchers' view, call for

more initiatives to reduce teenage obesity.

"The teens are a key period for measures to tackle obesity, since doing so then brings [better health](#) in the long term," states Frida Dangardt, the first author of the article. She is Associate Professor in Clinical Physiology at Sahlgrenska Academy, University of Gothenburg, and a doctor at Queen Silvia Children's Hospital, part of Sahlgrenska University Hospital in Gothenburg, Sweden.

The study, published in *The Lancet Child & Adolescent Health*, covers 3,423 children whose body composition was measured at ages 9, 11, 13, 15 and 17. The method used was DEXA (dual energy X-ray absorptiometry) scanning for whole-body measurement with weak X-rays. DEXA scans yield clear figures on fat, muscle and bone proportions in the body.

Assessing obesity in a population of children and adolescents through puberty is otherwise difficult. Using Body Mass Index (BMI) as a measuring method is complicated by children's increasing muscle mass and rapid growth spurts.

Obesity a key factor

In the study, the scientists investigated whether [blood vessels](#), too, were affected by other [risk factors](#) for cardiovascular disease, such as [high blood pressure](#), high blood lipid (fat) levels and high blood sugar. These factors were associated to some extent with increased [arterial stiffness](#) at age 17, but mainly for those who had obesity.

"We've been able to demonstrate that fat mass as such is what is most strongly associated with arterial stiffness, but that inferior metabolic health boosts this effect," says Frida Dangardt.

Stiffness in the arteries, which is gauged by measuring pulse-wave velocity, is a clear sign of atherosclerosis. In adults, it entails elevated risks of heart attack, stroke and death from cardiovascular disease.

However, the study showed that it is possible to influence arterial stiffness. The children and adolescents who normalized their fat mass also attained normal arterial resilience—a key result for future research on weight-loss programs.

Risk that can be influenced

"The fact that we can see, already in the teenage years, that a decrease in fat mass brings about a normalization of the arterial stiffness is positive, since it shows we can do something about this risk," says Frida Dangardt.

The DEXA scanning [measurement method](#) is emphasized as a key factor in the context. The study makes it clear that this method is considerably more reliable than BMI for studying [obesity](#) trends in childhood and adolescence.

The data in the study were obtained from the British long-term study Children of the 90s, which is based in Bristol, UK.

More information: Frida Dangardt et al. Association between fat mass through adolescence and arterial stiffness: a population-based study from The Avon Longitudinal Study of Parents and Children, *The Lancet Child & Adolescent Health* (2019). [DOI: 10.1016/S2352-4642\(19\)30105-1](https://doi.org/10.1016/S2352-4642(19)30105-1)

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